May 16, 2006 CPC

STAFF'S
REQUEST ANALYSIS
AND
RECOMMENDATION

06PR0366

Otterdale Partners, LLC
Palmore Tract

Matoaca Magisterial District
7201 Otterdale Road

REQUEST: Appeals the decision of the Director of Environmental Engineering pursuant to County Code § 19-231(d) relating to a site-specific Perennial Flow Determination conducted by the Office of Water Quality.

RECOMMENDATION

Staff recommends that the Commission uphold the County's decision for the following reasons:

County staff assessed the subject property in accordance with the requirements of the Chesapeake Bay Preservation Act and the County's ordinance using a reliable, site-specific evaluation as approved by the Chesapeake Bay Local Assistance Department (CBLAD). The applicant used a photo-documentation method for their determination of perennial flow. The applicant's photographs show a dry channel in the Upper Swift Creek Watershed (located in the Triassic Basin) at a time of year when very low flow, or possibly no flow, could be expected even for perennial streams. Due to the nature of Triassic Basin soils, it is not uncommon for stream systems in this area to appear dry for periods during the summer season. Therefore, while photo-documentation is approved by CBLAD for the determination of perennial flow, its use may not be appropriate for the stream systems of the Upper Swift Creek Watershed or Triassic Basin. A reproducible scientific method using multiple indicators, as the one used by the County, should be applied under these circumstances.

GENERAL INFORMATION

Location:

East line of Otterdale Road and south of Foxcreek Crossing. Tax ID 712-672-3060 (Sheet 15)

Existing Zoning:

A (Agricultural)

Size:

74.4 acres

Existing Land Use:

Open pasture currently used for cattle and some forested area with mostly hardwood trees. Residential.

DISCUSSION

FIELD CONDITIONS

The property is a 74.4-acre tract located east of Otterdale Road and south of Foxcreek Crossing in the Upper Swift Creek Watershed. The water resources on-site include the main stream West Branch (located along the northern edge of the property), several tributaries, two farm ponds and areas of wetlands. West Branch originates off the property and receives drainage from 611.48 acres (approximately 1.0 square miles; Please refer to figure 1).

METHODS & FIELD DETERMINATIONS

Chesterfield County uses the *Field Indicator Protocol* as "a reliable, site-specific evaluation" for the purpose of evaluating stream flow. This method is one of five that can be used by local governments to determine or confirm site-specific evaluations.

The field indicator protocol (primarily the Fairfax Method) is used among professionals in Chesterfield due to its ease of use and reproducibility. This method evaluates stream geomorphology, hydrology, and biology to determine perennial flow, with a value assigned to each of these indicators. A score of 25 ± 3 or greater indicates a stream has perennial flow.

The County's Office of Water Quality (OWQ) conducted perennial flow determination of the property's waterways using the Fairfax Method in December 2005 and again in April 2006. County staff determined that West Branch, which borders the northern portion of the property, is perennial (Please see the attached map, Figure 2, indicating the location of each station on the property and adjacent properties). This main stream section of West Branch received scores

indicating perennial flow in both December and April. On both assessment dates, the scores for stream geomorphology and biology gave a strong indication of perennial flow.

On July 25, 2005, the applicant's consultants conducted a visual inspection of the property using the photo-documentation method. Photographs of West Branch showed a stream containing little water, or as indicated by their report, "some pools of water" along the main channel (Please see the attached map; Figure 3, which indicates only those photo site locations in disagreement). Although the method used by the applicant was incorrectly performed (*i.e.*, up-stream and down-stream photos at each station), the photos submitted were adequate to document the stream condition. Additionally, daily climatological data, as recorded from Richmond Int'l Airport from January 2005 thru August 2005 were submitted as supporting documentation, along with Palmer Indices for the months of July and August 2005.

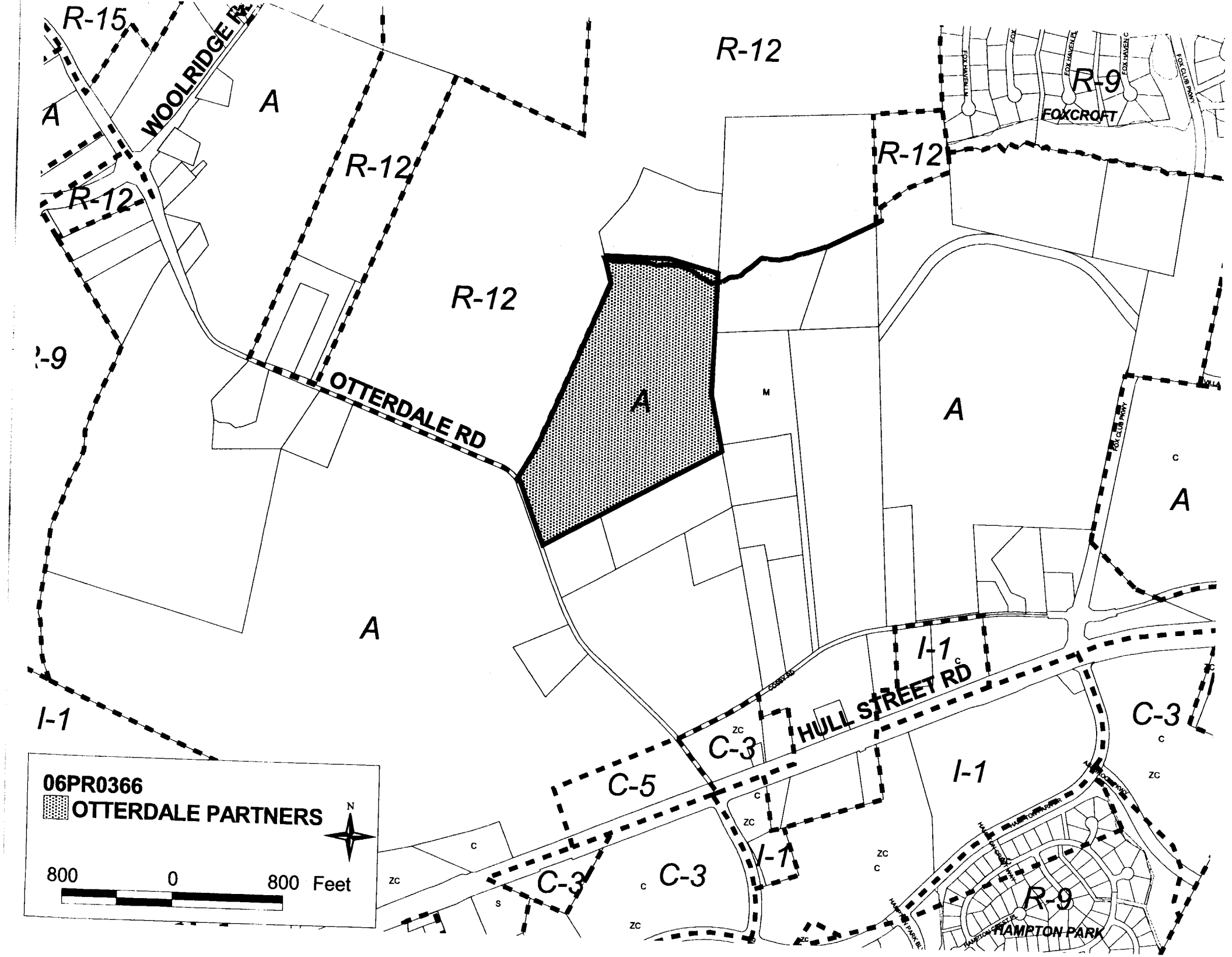
WATERSHED DISCUSSION

The project drains into West Branch, one of nine major tributaries of the Swift Creek Reservoir. The Reservoir's watershed is located in the western portion of the County contained within the area known as the Triassic Basin. The Basin is a geological region known for its coal deposits, and sandy/gravelly bottom streams. Stream flow data collected by the Department of Utilities at tributary stations located in this area have demonstrated that it is not uncommon for stream systems in this region to exhibit visually dry conditions during periods in summer months. This case is especially prevalent during periods of below normal rainfall, as was noted in 2005.

A trait characteristic of Triassic Basin streams is a large and fully functional "hyporheic zone". This zone is the accumulation of course textured sediments (sand and gravel) over the bottom of the channel that can be up to 2-3 ft deep in small streams. Channels may appear dry, but usually exhibit wet bed material and pools of water. This observation was indicated in the applicant's photographic documentation and also outlined in their comments. The presence of hyporheic flow in combination with strong geomorphology scores and biological indicators demonstrates that West Branch exhibits perennial flow. A brief discussion of the hyporheic zone is documented in the *Identification Methods for the Origins of Intermittent and Perennial Streams Version 3.1 North Carolina Division of Water Quality* as approved by CBLAD.

CONCLUSION

The two methods, 1) field indicator protocol and 2) documented observation, are approved by CBLAD as "a reliable, site-specific evaluation" for determination of perennial flow. However, given the unique stream conditions of the Upper Swift Creek a more reproducible scientific method such as the field indicator protocol is more appropriate. Therefore, the appeal should be denied because the County's evaluation showed the stream to contain perennial flow.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